

The Practical Journal of Sustainable Living

Clean Slate

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**NEW ZERO
CARBON BRITAIN
HUB AT CAT**

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NON-PROLIFERATION**

**A GREEN NEW DEAL
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Crossword: Brominicks is on holiday.

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Centre for Alternative Technology
Canolfan y Dechnoleg Amgen

BUY SOMEONE THE GIFT OF SUSTAINABILITY

CAT membership is the perfect gift for anyone who cares about climate change and other environmental issues and wants to know what they can do to help.

“It’s always inspiring to hear people from CAT talking. You’ve inspired us for decades.”

Eluned Morgan AM

Buy someone a membership gift pack today and they’ll become part of CAT’s thriving and growing community of changemakers, plus:

- A gift welcome pack, explaining how to make the most of CAT membership
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- A gift to unwrap on the special day
- And the knowledge that your gift helps support positive solutions to the challenge of climate change



MEMBERSHIP OPTIONS

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Why become a member of CAT?

Our members tell us that grappling with the urgency of and scale of environmental issues, like climate change, can feel overwhelming and huge. Being part of CAT and a wider community of people who are working on positive solutions to environmental problems can help.

Becoming a member of CAT is a perfect way to help CAT continue its extensive educational work and ensure that we can plan the future with confidence.

Contact Penny Rowland at CAT for more information 01654 705988.



Solutions for zero carbon

CAT has ambitious plans to massively scale up what we offer over the next year to help turn climate emergency declarations into effective climate action.

We're excited to announce that this autumn will see the launch of a new Zero Carbon Britain Hub and Innovation Lab to help community groups, local authorities, businesses and governments to create plans for reaching net zero greenhouse gas emissions, and to support innovative responses to the climate challenge.

As awareness grows of the need to take urgent action, and as more and more towns, cities, counties, organisations and governments declare a climate emergency, we have been inundated with requests for presentations, training and advice. CAT's expertise in modelling zero carbon scenarios and in the technologies and skills needed to get to net zero is vital at this time.

We need action at all levels, from individual to international, and this issue of *Clean Slate* covers a lot of ground in showing what can be done.

On the international stage, Andrew Simms and Peter Newell argue for a non-proliferation treaty to keep fossil fuels in the ground, tackling climate change via an international agreement built on a similar model to the nuclear weapons treaty of 50 years ago. Turn to page 22 to find out more.

As a growing global movement calls for a Green New Deal to help fund a just transition, Jonathan Atkinson looks at what such a deal might mean for the UK housing sector (page 30), whilst Anne Chapman and Jonathan Essex look at the potential for new jobs in areas across the UK (page 26).

On an individual level, we can all help with the transition – some of the key things we can do are to fly less (or not at all), eat less meat and dairy (or switch to a vegan diet) and make our homes more energy efficient. On page 33 you'll find advice from Nathan Goss for anyone struggling to do the latter in a traditionally built home.

But perhaps the most important thing we can do is to raise our voices and to work with our communities for change.

As a CAT member, you're already a vital part of the transition – and we know many of you are involved in pushing for change in a range of different ways. We hope you'll join with us and millions of others around the globe in September to push for urgent action on climate change (see page 21).

And if you would like advice on zero carbon planning, keep an eye on our website for announcements about the new Zero Carbon Britain Hub and Innovation Lab.

Working together, we can make the radical changes needed to turn things around – thank you for your support at this crucial time.

Paul Allen,
Zero Carbon Britain project coordinator

Keep in touch



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CAT appoints new CEO

We're pleased to announce that CAT's Board of Directors has appointed Peter Tyldesley as Chief Executive Officer.

Currently CEO at conservation charity the Bradgate Park Trust, Peter has substantial experience in leadership and management, both directly and through his non-executive roles on charity and partnership boards. Previous roles include a range of appointments in Wales, including with Brecon Beacons National Park.

Peter brings to the role a strong personal commitment to sustainability and the environment, as well as to education.

CAT Chair of Trustees Mick Taylor said: "We are delighted to announce Peter's appointment as CAT Chief Executive Officer. CAT's environmental education and research work has never been more important, with the need for urgent action on climate change making it essential that more people gain knowledge, skills and understanding in environmental solutions. Peter's leadership experience and commitment to sustainability make him ideally placed to lead the organisation at this crucial time."

Peter said: "Having been a supporter of CAT's work for many years, I am honoured and excited to be joining the organisation at a pivotal time for our planet. If we are to tackle dangerous climate change and other pressing environmental issues, we need to urgently roll out solutions – I'm looking forward to joining such a forward-looking and visionary organisation and helping to inspire change."

Peter will take up the role in early September following the departure of Adrian Ramsay earlier this year.



CAT's new CEO Peter Tyldesley.

New hub and innovation lab to share zero carbon solutions

A new Zero Carbon Britain Hub and Innovation Lab is being launched at CAT later this year to help communities, local authorities and policymakers to create Zero Carbon Action Plans, and to provide support for the development of innovative solutions.

In the past few months, as awareness of the urgency of action on climate change has grown, we have been inundated with requests from governments, political parties, councils, community groups and businesses, all wanting CAT's help with drafting policies and plans that will turn climate emergency declarations and targets into on-the-ground action. In July we secured a substantial gift from the Moondance Foundation that will allow a step-change in our ability to respond to these requests through the creation of a new Zero Carbon Britain Hub and Innovation Lab.

The Zero Carbon Britain Hub will provide a programme of support aimed at increasing the confidence, competency and effectiveness of policymakers, communities and organisations in developing Zero Carbon Action Plans tailored to their needs. We will be offering participative training courses and events at CAT and in venues across the UK, as well as online training. These will include 'train the trainer' courses to allow people to share knowledge with their colleagues and communities. Mentoring programmes and access to expert advice will help guide people through the process of developing and

implementing Zero Carbon Action Plans, whilst an online platform will provide tailored digital resources to help support the journey to zero carbon.

Alongside this, a Zero Carbon Britain Innovation Lab at CAT will help unlock sustainable solutions to specific challenges. From technical innovations to social and economic solutions, CAT's new living laboratory will open up opportunities for researchers, entrepreneurs, businesses, governments, citizens, councils and foundations to work together to create innovative, proven, effective climate solutions.

In order to tackle complex problems like climate change we need solutions that work across a wide range of interacting areas; solutions that not only offer technical fixes but also help overcome political, cultural, economic and psychological barriers. The Zero Carbon Britain Innovation Lab will: respond to key issues, priorities and tasks identified by the Zero Carbon Britain Hub; test and prototype solutions; and create routes into larger scale impact or systems change.

The Zero Carbon Britain Hub and Innovation Lab represents a real step-change in CAT's ability to provide support, advice and solutions to help in the transition to zero carbon. Keep an eye on our website for announcements as the project gets underway – and make sure you're signed up to our newsletter to receive updates. www.cat.org.uk



CATkins: new parent and toddler group launched

Launching this September, CATkins is a new weekly outdoor club for under 5s designed to get kids closer to nature whilst supporting early years' learning and development.

Nature-loving toddlers and their parents can come together to discover the great outdoors through nature craft, wild play, making, creating, building and all-weather adventures.

There are a range of different activities for children to choose from that are both self-directed and adult led. The main focus of the activities is nature, wildlife, outdoor exploration and environmental change, encouraging children to take notice of the changing seasons and the world around them.

The sessions will mostly take place in CATkins Corner, a dedicated space on the main visitor circuit. With paths to explore, a tiny pond to dip in and wild hedgerows and trees to discover, CATkins Corner is perfectly located for outdoor play.

Find out more and book your place at www.cat.org.uk/catkins



CAT Engagement Manager Amanda Smith explores solutions with a young visitor.



Building tiny homes for nature with Project Pollinate

Visitors to CAT this summer joined families across the UK to take part in 'Project Pollinate'.

Wasps and bees, moths and butterflies, beetles and flies – all pollinate plants and help our natural landscape to flourish.

CAT teamed up with Eco Attractions Group members, including Eden Project, Kew Gardens and the National Botanic Gardens of Wales, to encourage visitors to design and build homes for mini beasts (aka 'Pollinator Palaces'). Photos of their amazing creations

were shared across Instagram, encouraging others to join them in becoming pollinator protectors.

Other activities throughout the summer holidays included energy inventor workshops, hands-on earth building, nature trackers, den building and wild wellbeing days, helping thousands of visitors to reconnect with nature and explore climate solutions in a fun, interactive way.

If you're visiting with family during October half term, look out for more special events, including autumn themed nature crafts and activities. Find out more at www.cat.org.uk/visit

Architecture end of year show

On Saturday 7th June, fifth year students from our MArch: Sustainable Architecture Part II degree celebrated their end of year show with a special evening event, including talks from programme leader John Carter and special guests from architectural practice. The show was then opened to the public on Saturday 8th June.

Students' final projects are the culmination of two years of study, exploring the range of challenges that we will face with advancing climate change, and seeking to 'do architecture differently' in response to the need to live within planetary boundaries.

The students' work was also on show at the Crypt Gallery in London from 28th June to 2nd July as part of the London Festival of Architecture – an important chance to showcase solutions to a wider audience.

You can see a taster of some of the work on pages 18-19, and you can view all of the students' projects in the 2019 student yearbook, available on our website at www.cat.org.uk/gse



MArch students and invited guests at the end of year show.



10 years of CAT's Architecture Part II: Our Sustainable Architecture Part II course celebrated its 10-year anniversary in June, with a joyful reunion from across the years. Picture shows some of our lecturers and tutors from 2009 to the present day.



Hands-on learning for project week

In June CAT's Graduate School special project week saw students experimenting with solar water heating, analysing the impact of different types of habitat management, exploring how a town can plan for net zero greenhouse gas emissions, and working on improving the thermal comfort of emergency shelters.

Project week is a chance to take an in-depth look at a particular area, gaining practical and analytical skills and working with others to explore solutions.

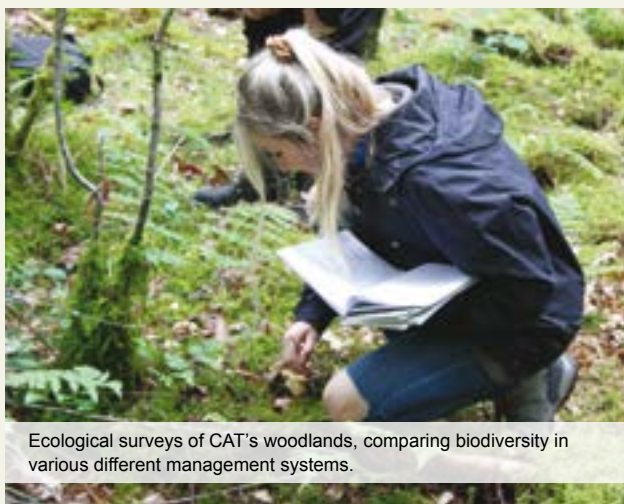
Students on our MSc Sustainable Food and Natural Resources took part in a habitat management project, which compared biodiversity in a range of situations, contrasting grazed uplands with rewilding areas and conifer plantations with sustainably managed woodland, for example. Students looked at the impacts of different management practices and explored how we can transform the way we use and manage land to help us achieve zero carbon whilst protecting and restoring wild nature.

Another group of students spent the week working with the local Machynlleth Climate Emergency Action Group, which was created as part of the town's declaration of a climate emergency. Students worked with the group on a systems analysis encompassing active travel, food needs, land availability and community engagement amongst other things. A report was then produced for the group to help their decision-making.

Emergency shelters for conflict zones or areas that have been affected by natural disasters are often an essential part of protecting human life in the immediate aftermath of a devastating event. Students built and tested emergency shelters then looked at how these could be adapted to provide improved thermal comfort and protection from the elements.

Finally, our MSc Sustainability in Energy Provision and Demand Management students looked at a test solar thermal water heating rig, exploring the impact of changing weather conditions, different orientations and varying amounts of shade on the amount of heat captured by the system.

Find out more about all of our courses and explore how CAT provides skills for climate solutions at www.cat.org.uk/gse



Ecological surveys of CAT's woodlands, comparing biodiversity in various different management systems.



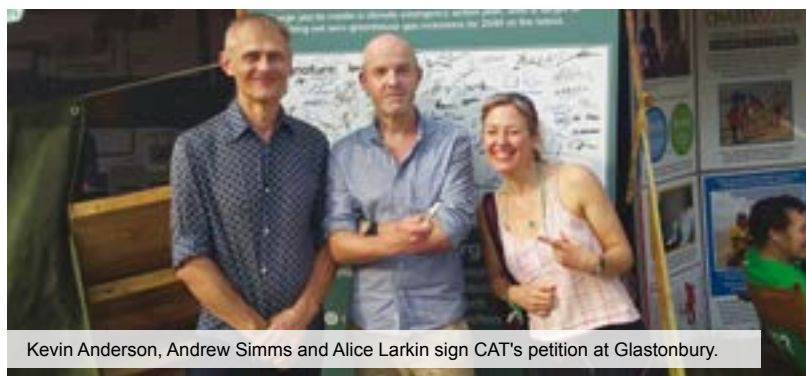
Experimenting with adaptation measures in Bangladesh.

Support for climate vulnerable people in Bangladesh

In May, CAT hosted a special delegation from the Christian Commission for Development in Bangladesh (CCDB), a Bangladeshi NGO that works to improve the situation of the country's climate vulnerable people.

Amongst other initiatives, CCDB is developing a Climate Technology Park at the centre of Bangladesh that aims to be 'a one stop solution for climate vulnerable people', helping them to overcome the challenges they face in their areas. Plans include displays and demonstrations of climate change adaptation and mitigation technologies, training in green building and interactive learning facilities, along with conference and exhibition spaces.

A small group from CCDB visited CAT to take part in a short residential educational programme to hear about our research into zero carbon scenarios and to find out more about renewable technologies and sustainable building materials and methods. Following the visit, the organisers said "We learnt a lot that might be helpful for the development of a Climate Technology Park... Hopefully [the collaboration] will continue in future for the development of the climate vulnerable people of Bangladesh and beyond."



Kevin Anderson, Andrew Simms and Alice Larkin sign CAT's petition at Glastonbury.

On the festival trail this summer

We were talking climate solutions and skills in the midsummer sun at this year's Glastonbury Festival in June.

Tutors and graduates from our Masters in Sustainable Architecture course built a locally sourced timber-frame structure in the Green Futures Field to house displays about our Zero Carbon Britain research. Hundreds of people signed our petition calling for a Climate Emergency Action Plan, including climate scientists Professor Kevin Anderson and Professor Alice Larkin and radical economist Andrew Simms (pictured).

July saw CAT Senior Lecturer Louise Halestrap and earth building expert Rowland Keable delivering an interactive show on the joys and benefits of building with earth at Bluedot Festival at Cheshire's Jodrell Bank Observatory, whilst Paul Allen and architecture lecturer John Carter headed to the Green Gathering in Chepstow in early August to talk zero carbon solutions and green building.

If you'd like to know about upcoming events that CAT speakers will be presenting at, follow us on twitter for all the latest news: [@centre_alt_tech](https://twitter.com/centre_alt_tech)

Clayfest at CAT

CAT became the centre of all things earthy for three days in June as Clayfest rolled into town. The annual event organised by Earth Building UK and Ireland is a chance for experts and learners to experiment and learn together during a long weekend spent exploring the properties, uses and aesthetics of building with earth.

Over 90 people joined us on day one for the Clayfest conference in CAT's Sheppard Theatre – its massive circular rammed earth walls making it the perfect venue for clay-based discussions. Day two was spent on practical demonstrations, including clay plastering, rammed earth and decorative work. The innovative CobBauge project, which brings together experts from across Europe, looked at how a combination of cob mixed with agricultural fibres and waste fibre can be used to produce a strong building product that is able to meet the thermal conductivity specifications required by present day building regulations. The event was rounded up on day three with a tour of earth builds in the local area.

Events like this are an important chance to share knowledge and experience of low impact building materials and methods, learning from experts in different fields and working together on solutions and skills-development.

Planning for next year's event is already underway – keep an eye on the CAT website for details: <http://www.cat.org.uk/whats-on>



Creating test blocks using different earth mixes to explore the properties that make a good rammed earth wall.



Mixing cob for some hands-on experimental building.



Different mixes of earth and binder, including hemp shiv and miscanthus.



Culture Declares!

On 8th July, as part of London Climate Action Week, the 'Culture Declares Emergency' network held an event exploring the role of arts and culture in a climate emergency action plan. **Paul Allen** joined them to talk solutions.

Culture Declares Emergency is a powerful emerging network of creative practitioners and organisations. Since its launch in April, around 450 individual artists, groups, networks and venues including the Royal Court, Battersea Arts Centre, Somerset House and Manchester's Home have formally declared a climate emergency, and are working up creative responses.

I was honoured to be invited to share CAT's Zero Carbon Britain research with a packed room of artists, writers, musicians, filmmakers and arts venue organisers in North London's legendary Roundhouse. As the event opened, the Roundhouse formally signed up to Culture Declares Emergency.


I was part of a five-person team, including international lawyer Farhana Yamin, who were given the task of opening new conversations around the role of 'culture' in this climate and biodiversity emergency.

In the first round, each of us spoke briefly on the climate emergency; my presentation explored climate feedbacks, the systemic carbon 'lock-in' embedded in our society, and the lack of action from government and industry.

Then, after a break during which the Roundhouse was filled with the recorded voices of many of the bird species facing extinction, the panel reassembled to focus on the solutions.

My focus was on what I call 'evidence-based optimism'. Many of the solutions included in our Zero Carbon Britain work are now seeing a rapid acceleration in the scale and speed of their deployment. Scaling up deployment leads to new research into manufacturing, which in turn leads to price drops. Price drops then lead to more scaling up, and so it goes on. The falls in the cost of solar PV and wind have been faster than even the tech experts predicted!

The shift can also be accelerated by revealing the synergies between the investments needed to reach net zero and the co-benefits and cost-savings in improving health and wellbeing, enhancing biodiversity, creating jobs, reducing poverty, stabilising our economy, and increasing our resilience and ability to adapt to climate change. These 'multi-solving' opportunities also widen the scale and scope of communities engaged in the net zero transition.

But perhaps the most exciting development is the cultural shift that we are now seeing accelerating across the globe as schoolchildren, activists, councils and even parliaments demand urgent climate action – a shift that initiatives like Culture Declares are helping to accelerate. The Culture Declares network has a unique role in bringing to life net zero solutions and, in the process, helping foster a stronger, more resilient society, united in a new sense of collective purpose. 

This is an edited extract from Paul's blog about the event. To read his full account, visit www.cat.org.uk/blog



Paul shares Zero Carbon Britain research at the climate lobby.

'The Time is Now' mass lobby of Parliament for climate action

On Wednesday 26th June 12,000 people mustered at Westminster in a mass lobby calling for urgent climate action.

Organised by the Climate Coalition, of which CAT is a member, and the Greener UK group, the 'Time is Now' mass lobby saw people from every part of the UK surround Parliament, with an estimated 195 MPs meeting constituents to hear their concerns.

It was incredibly inspiring and uplifting to see such a wide range of people – from WI groups to faith groups to schoolchildren – coming together to demand urgent action now.

Read our blog about the lobby at www.cat.org.uk/blog

Zero Carbon at the first ever 'Climate Emergency People's Assembly'



*Initiated by Extinction Rebellion campaigners, sponsored by Welsh Assembly Members Jenny Rathbone (Labour) and Llyr Gruffydd (Plaid Cymru), and held in the Welsh Assembly Senedd, the Climate Emergency People's Assembly set out to explore the role for direct civic engagement in developing priorities that are both fair and effective in rapidly reducing Wales' carbon emissions. **Paul Allen** went along to take part in the discussions and share CAT's Zero Carbon Britain research.*

On 4th July, I was honoured to be invited to present evidence from CAT's Zero Carbon Britain research to the first ever Climate Emergency People's Assembly.

Composed of around 50 volunteers from across mid and south Wales, the 'People's Assembly' set out to prototype and explore how this process could support the Welsh Government in raising ambition across society. Their aim was that this 'test-bed' would lead to a formal 'Citizens' Assembly', in which participants are selected from across society with a direct and formalised role in decision-making.

The event opened with a 30-minute slot where I presented evidence from the key findings of CAT's Zero Carbon Britain research. My key messages were: we have all the technologies we need; this must also embrace changes in land-use; and, if we do it in the right way, with the right skills, there are many co-benefits.

My evidence was then cross-examined in a very detailed question and answer session, followed by break-out group discussions exploring the key question: what would be the core components of a fully inclusive climate action planning process?

After much discussion and passionate debate, the People's Assembly proposed that a Climate Emergency Action Plan for Wales should include a clear civic call to 'get on with it' and deliver radical action. It also highlighted the need for a 'just transition' that would support workers and businesses currently engaged with fossil fuels to move to new industries. There was a call for a Wales-wide programme to offer the new skills and education needed, plus a focus on multi-solving to maximise the co-benefits.

There were also calls to build on existing legislation such as the Active Travel and the Wellbeing of Future Generations Acts. Their final call was for the Welsh Government to consider the role of more formal Citizens' Assemblies to guide the action planning processes.

Each member of the People's Assembly went on to formally lobby their Welsh Assembly Member to take up these ideas.

In the afternoon there was a more formal engagement session, where a range of Assembly Members, including the event sponsor Jenny Rathbone, Rebecca Evans, Jane Hutt, Joyce Watson and Jeremy Miles, joined the group along with Anna McMorrin MP. Their input was most uplifting, offering clear support for this new people's process, and backing the call for a radical climate emergency action plan for Wales.

If you are planning a People's Assembly or other climate emergency event and would like to include evidence from CAT's Zero Carbon Britain project, please get in touch. Email us at members@cat.org.uk or call us on 01654 705988. [CS](#)



Discussing solutions at the 'People's Assembly' in Cardiff.



Thank you for your support

Thank you so much to everyone who has given to our recent appeals.

At this time of climate crisis, it is crucial that proven, effective solutions and the skills and knowledge needed to implement them are at the heart of the global conversation.

We have a very short window in which to take effective action to keep the world within 1.5°C of warming and CAT's research and education work helps equip a new generation of changemakers with the inspiration, information and understanding to go out and make a real difference in the world.

Our heartfelt thanks for your support in making this work possible.

If you would like to make a donation, or can support our work in other ways, please get in touch – call us on 01654 705988 or email members@cat.org.uk. You can also donate online at www.cat.org.uk/donate.

CAT on Countryfile

BBC Countryfile visited CAT in June to explore some of the solutions to the climate emergency. Watched by an estimated 4.5 million people, the special 'Caring for our planet' episode focused on CAT and some of the fantastic community projects in our local town Machynlleth.

Speaking to presenter Anita Rani, Paul Allen gave an overview of the climate emergency and outlined what's needed to get to net zero greenhouse gas emissions in time to have a chance of staying within 1.5°C of warming. CAT lecturer Tim Coleridge talked insulation and retrofitting, with some hands-on experiments with low impact building materials, whilst Dr Frances Hill and a group of CAT MSc students were seen experimenting with solar thermal water heating.

The episode also featured Machynlleth's declaration of a climate emergency, our local repair café and Mach Maethlon (Edible Mach) community food project.

Find out more about solutions for zero carbon on our website at www.cat.org.uk/zcb

New Zero Carbon Britain report coming soon

CAT's Zero Carbon Britain technical scenario, which shows how the UK can become zero carbon using technology available today, is being updated, with a new edition due out this autumn.

Published in 2013, *Zero Carbon Britain*:

Rethinking the Future models how we can power down energy use through large-scale retrofitting of buildings and radical changes to the transport system, and how we can power up renewable energy supplies to provide a clean electricity supply. It also explores changes to diets and land-use, looking at how we can cut emissions and start to repair and restore natural carbon sinks like woodlands and peatlands.

This research is now being updated to take into account recent advances in technologies and changes in land-use as well as more recent figures for UK emissions and energy use.

Now the UK has declared a climate emergency we urgently need to show how we can get to zero carbon, and to ensure that the transition happens as quickly as possible in a fair and just way. CAT's research shows how it can be done and we provide the necessary skills and knowledge to help make change happen.

If you'd like to keep up-to-date with our work, make sure you're signed up to our regular newsletter – you can subscribe today at <http://www.cat.org.uk/sign-up>

New degrees validated

Two new degrees starting in September are now fully validated by Liverpool John Moores University.

MSc Sustainability and Ecology explores the issues surrounding the protection and rehabilitation of nature whilst maintaining essential or useful ecosystem services. MSc Sustainability and Behaviour Change looks at theories and concepts of behaviour change at all levels, from policy mechanisms to community and individual action.

A third new degree starting this September, MSc Green Building, is currently going through the final stages of validation by the University of East London.

Find out more about these and other postgraduate degrees in sustainability at www.cat.org.uk/gse

New workshops for pre-schoolers

You're never too young to start learning about sustainable solutions! CAT's Engagement Team is developing a range of new activities for pre-school groups, helping them to learn about clean energy and green building in a fun, interactive way.

A 'Windy Day Workshop' looks at the power of the wind, with stories, pinwheels

and tours of our wind turbines, whilst a 'Three Little Pigs' tour explores different building materials and methods that remain impervious to the huffing and puffing of the rewilded wolf!

We're also developing a range of nature-based activities to help children to connect with this amazing world.

Find out more about these and other activities for young people at www.cat.org.uk/schools

New 'Living Wales' exhibition opens at CAT

This summer, CAT opened the doors on 'Living Wales', a brand new visitor exhibition which has been developed in collaboration with Aberystwyth University.

Using a combination of cutting edge satellite observation, computer analysis and input from the public on the ground, Living Wales is able to capture incredible details and information from the Welsh landscape and represent it through fascinating interactive displays.

Acting as the public facing showcase for the project, the exhibition allows visitors to see how satellite imagery has revealed the scale of climate change over the last 30 years and to explore how technology can help us manage solutions in the future.

John Challen, Head of CAT's Eco Centre said: "Living Wales offers fantastic opportunities for engaging the public with the bigger picture. We're inviting the public to come and get involved and to help us collect the data to feed in to the exhibition. It's a totally different way to learn about our changing environment."

Alongside the new exhibition, new 'TrackerPack' backpacks provide guides and ID kits to help nature spotters of all ages to identify and record plant and animal species, and visitors can learn how to use a range of free mobile apps to collect and record information that can help scientists to track the impacts of climate change on our native plant and animal species.

The team at CAT are busy developing workshops and activities for audiences ranging from families and school groups to academic groups and short courses. Topics will include everything from biodiversity surveys through to studies on climate change with the help of state-of-the-art satellite data.

Find out about this and other exhibitions and activities at www.cat.org.uk

Inspiring action at the CAT conference

We're finalising the programme for this year's CAT Conference, 27th -29th September.

We'd love you to join us!

Tickets are £200 per person, including accommodation and food, for Friday evening to Sunday morning.

Paul Allen and other Zero Carbon Britain researchers will unveil the latest findings of the new updated technical scenario, looking at how we reach net zero greenhouse gas emissions using technology available today.

We'll explore all the latest work that CAT's been doing with school pupils, graduates, and policymakers across the UK and beyond.

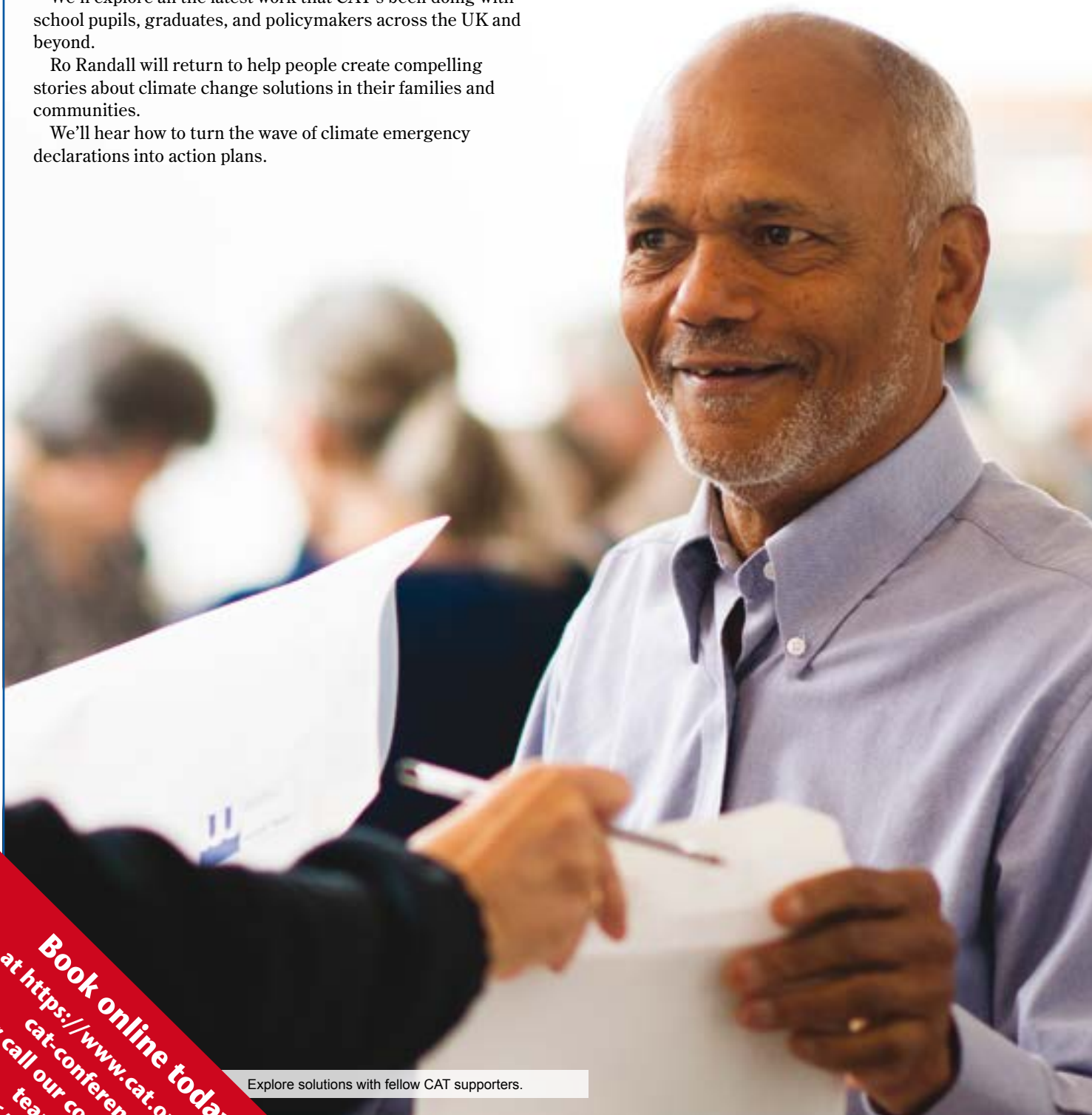
Ro Randall will return to help people create compelling stories about climate change solutions in their families and communities.

We'll hear how to turn the wave of climate emergency declarations into action plans.

A world café style session will enable more conference attendees to present and talk through their own work in their communities.

Plus many more speakers and workshops have been lined up to discuss the climate strike, the school strikes, the role of people's assemblies, the latest in low carbon building and transport techniques.

Please note: Spaces are filling up fast, and accommodation in our WISE building is nearly sold out! Book your place now to avoid missing out.



Explore solutions with fellow CAT supporters.

Book online today
at [https://www.cat.org.uk/
cat-conference/](https://www.cat.org.uk/cat-conference/)
or call our conference
team on
01654 705988

Adaptation and transformation on display at the Wales Festival of Architecture

CAT architecture student work was showcased as part of the 2019 Wales Festival of Architecture, with exhibitions in Aberystwyth and Portmeirion in June and July.

For the past four years, our students have worked with local communities, exploring how they could be transformed to reduce environmental impact and help with climate change adaptation. The projects highlight the risks of climate change to coastal areas such as Barmouth and Harlech, looking at ways of building sustainable, resilient communities whilst tackling the root causes of global warming.

A specially produced book showcasing the projects was included as part of a month-long exhibition celebrating architecture in Wales. You can view the book and explore the projects on our website at www.cat.org.uk/architectureprojects

From Felixstowe to Fishguard

This summer, CAT supporter Richard Smith walked across Britain to explore a cross-section of the country and raise funds for environmental charities, including CAT.

Covering a distance of 270 miles as the crow flies, Richard's walk took him along the line of the 52nd parallel north, or 52° North, starting from Felixstowe on the Suffolk coast and finishing at Fishguard on his 52nd birthday.

The idea for the walk started as a response to family loss: Richard's wife, aunt and mother all died from cancer over the last five years, and his dad died shortly after his mum. Richard says that he was, "brought up walking, so getting outside for some fresh air and exercise, particularly as an antidote to bereavement, was a natural idea."

The notion of walking along a straight line of latitude was about exploring a cross-section of Britain, finding hope and positivity in the people and places he discovered on the way.

We'd like to say a really heartfelt thanks to Richard and to all of the people who sponsored his walk. You can find out more at www.52inBritain.co.uk

If you'd like to raise money for CAT, please get in touch – call Tanya on 01654 704950 or email fundraising@cat.org.uk

Support CAT's call for a climate emergency action plan

Radical action is needed now if we are to avoid dangerous climate breakdown.

Please sign and share CAT's petition calling on the UK and devolved governments to produce an urgent climate emergency action plan.

You can read the text below and add your support online at <https://www.cat.org.uk/petition>

To: The UK, Welsh and Scottish Governments

It's time for bold and ambitious action to prevent climate breakdown.

As someone deeply concerned about the future of our planet, I urge you to create a climate emergency action plan, with a target of reaching net zero greenhouse gas emissions by 2040 at the latest.

By powering up our renewable energy supplies, cutting energy use in transport and buildings, and transforming diets and land use, we can reach net zero without relying on unproven future technology.

I urge you to take action now.

Measures that could help us reach net-zero include:

- Phase out fossil fuels fast. Stop all subsidies to fossil fuels. Stop all fracking now. Stop burning coal.
- Support a nationwide programme to insulate the UK's housing stock, allowing us to power down our energy demand.
- Invest in renewable energy, including on-shore and off-shore wind, powering up our clean energy supply.
- Transform agricultural subsidies to support a food system that is good for the environment and for our health.
- Radically increase UK tree cover and enhance other natural climate solutions like soils and peatlands.
- Invest in joined-up affordable public transport, and in better infrastructure for walking and cycling.
 - Cut flights through a frequent flyer levy – and scrap the third runway at Heathrow.
 - Invest in the creation of green jobs and provide funding for training in skills for the future.

It's vital that all emissions are included in this plan, and we must pay our historic debts. The UK and other long-industrialised nations grew wealthy on the back of burning fossil fuels; climate justice demands that we take ambitious action now, and provide both financial and technical support for less developed countries to help with mitigation and adaptation measures.

Please help us reach more people by sharing with your friends and family.

Brian A Jackson

Talking solutions at CAT's climate emergency summit

CAT volunteer **Laurence Tidy** reports on a thought-provoking event



After the most well attended Zero Carbon Britain short course to date, over 100 people came together from across the UK to respond to the climate emergency at CAT's Climate Emergency Solutions Summit in early May. Through a series of talks, workshops and group sessions, the one-day event saw participants share ideas for solutions, thoughts on barriers to progress, and experiences of working on a range of issues at different levels.

The benefits of decentralised renewable energy sources are widely acknowledged. Mark Smith, Director of ZLC Energy, led a workshop exploring these benefits and looking at how to further progress in the sector via incentives, community-owned assets, and the installation of solar on all new building roofs. Central government certainly can step up in this area, and former Welsh Government Minister Jane Davidson gave an overview of the Wellbeing of Future Generations Act as an encouraging cross-party framework for sustainable development.

Government also has a role to play in funding, policymaking and relieving pressure on NGOs in the area of wetland management realignment, as discussed in a session given by Richard Shires. As for homes, despite case studies illustrating success in zero carbon living, Mark Smith also pointed to the scrapping of the Zero Carbon Homes standard as a backwards step. Such policies could be re-established as part of the action plan CAT is petitioning the UK and devolved governments to produce (see page 13).

Examples from history show that humanity is capable of making

radical changes at the kind of speed and scale required by climate change; in an inspiring workshop, Andrew Simms explored some useful case studies and looked at what can be learned about how we might create behaviour change across society.

Examples of local community groups making change happen included Extinction Rebellion Machynlleth and Zero Carbon Wedmore, who shared some of their successes, alongside John Williamson's presentation of an in-development digital tool for community action, and horticultural mentor Emma Maxwell's review of the first year of the 'Pathways to Farming' pilot project training growers in agro-ecological production and business skills on land at CAT, and in Machynlleth and Newtown (you can read more about this project on page 17).

Bringing young people into the discussions, CAT Engagement Manager Amanda Smith's session reviewed school curriculum changes and the global youth strikes, and shared stories of success in schools, whilst raising concerns about children's anxiety for their future.

The Summit was a great example of CAT's role as a hub for sharing climate solutions, bringing together people and communities from across the UK in the spirit of cross-fertilisation of ideas and inspiration to help build a Zero Carbon Britain.

If you'd like to join us in working together on solutions, come along to the next CAT Conference on 27th – 29th September – you'll find details on page 12. [CS](#)

Opinions expressed are not necessarily those held by CAT.
We reserve the right to edit letters where necessary.

A just and fair approach to carbon

Dear CAT

Mike Berners-Lee's writes in *Clean Slate* 112:

'The way to make it work is to have a *constraint on resources*, and in particular fossil fuels.' In your letters there are also comments on Martin Burgess's case in edition 111 for Personal Carbon Accounts.

My take on this issue takes me back to the rationing I was brought up with after the Second World War, not only of fossil fuels but sugar, meat, butter and much else. We were not then concerned about the consequences of consumption but with the limited supplies. With our developing 'climate emergency' is there not some way of using rationing to reduce the consumption of products that impinge on our climate?

The current use of taxation has a tendency to be unjust in that it penalises the less well off, whereas the wealthy can easily afford to pay the extra, and their conspicuous consumption is all too evident. Rationing on the other hand applies equally to all and would particularly constrain the wealthy to reduce their excessive consumption by downsizing on housing, cars, flights, etc.

I realise that the economics and politics of this would be challenging, but surely there must be a tool here for consideration as a just and fair way to achieve the dynamic for change that Mike Berners-Lee and other contributors to *Clean Slate* are seeking.

Lisle Ryder

Global lottery for climate funding

Dear CAT

On thinking about a way to get or enable a large part of the global population to do something to have a positive effect on the planet, I thought that a global lottery fund could be set up. The profits from sales being divided between renewable energy, conservation, running costs, etc plus an amount for winners. Ticket prices would vary between rich and poor nations to ensure that the higher the CO₂ the higher the cost of the ticket.

Any thoughts anyone?

Jon West

Wind farms – who benefits?

Dear CAT

I notice that the subtitle of your magazine is 'The Practical Journal for Sustainable Living'. While I applaud many of your articles, and am a supporter of wind power, I'm deeply sceptical of wind farms.

By turning over wind power to multi-national corporations, and giving those huge

corporations your support, you're damaging not only the planet but your credentials as a voice for sustainability.

Single dwelling turbines and solar panels should be the preferred options. Small is always preferable to big. We should be encouraged to use less electricity; the continued building of industrial 'wind farms' ploughs money straight into the pockets of big, international business, while local people and local communities are left behind.

If we're going to use words like sustainability, let's be careful about what we mean. Capitalism is the least sustainable option of economics we have. Let's not turn wind power over to huge corporations and see that power become just another missed chance.

Jeb Loy Nichols

Our view is that community and municipal ownership of wind farms would allow everyone to benefit – environmental benefits, lower bills, money back to the community/local authority to invest in things that benefit everyone. You can read more about this in our 'Zero Carbon Britain: Making it Happen' report, which you'll find at <https://www.cat.org.uk/zcb> It's also worth noting that in our Zero Carbon Britain technical scenario the vast majority of wind farms are off-shore, although we do think that government investment in on-shore wind is also an important part of the solution.

Understanding impact

Dear CAT

The problem with understanding your environmental impact is in keeping track of the stuff you buy, ascribing an impact to each item and then totting it all up. Once you've got a total impact you can then start to chip away at it by systematically changing your lifestyle one purchase at a time.

I am sure most *Clean Slate* readers do this, but we all have differing degrees of success and with different levels of determination. The problem is that we get tired or distracted and we get drawn back to the same old products from the shelves and so our impact never really goes down much.

After trying to find out the impact of my shopping I discovered that there is an invaluable data source – my own digital footprint. It turns out that the Co-op has a record of everything I have bought and it is shown against my membership number. Tesco will have the same against my 'Club-card' and so will every other retailer with a loyalty card system. And the beauty is that they have an obligation to disclose it to me under the General Data Protection Regulations (GDPR) as a data subject.



So now I know what I have bought, it would be really helpful to know the impact of each item. Does anybody know of some sort of database that has this? Better still could we crowd source this data? Any ideas?

Neil Kermode

Let's talk traffic

Dear CAT

Very little is mentioned of the density of road traffic and the seemingly endless new roads necessitated by ever-increasing housing and the ubiquitous private car.

The free movement of people around the country and around the world is making a major contribution to environmental degradation. Future humans deserve better than concrete, tarmac and traffic that prevents children walking to school and the enjoyment and freedom of the natural world, which should be their birth right.

P. R. Baker



We need to stop the spread of tarmac and traffic.

September 2019

7	Create a Felt Bowl
7 - 8	Building with Ecobricks and Cob
9 - 14	Sustainability & Adaptation: Concepts and Planning (Part A)
21 - 22	The Science Behind Gardening
21	Build a Lapsteel Guitar
21 - 22	Fixing your Damp House

October 2019

5	Compost Toilets
5 - 6	Build a Small Wind Turbine
5	Traditional Timber Frame Joints
6	Reedbeds and Waste Water Management
8 - 11	Social Forestry OCN
12 - 14	Introduction to Permaculture
12 - 13	Self-Build Project Management
12	Flat-bottomed Willow Basket Making
14 - 18	Low Energy Buildings (Part A)
25 - 28	Eco Refurbishment
26	Spoon Carving



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Pathways to Farming – strengthening the local food economy

One year into the Pathways to Farming project, Coordinator **Katie Hastings** gives a rundown on the work being done to strengthen the local food economy in Machynlleth.



When we designed our project Pathways to Farming, we had a vision to see everyone in the Dyfi Valley eating food grown in the Dyfi Valley – a seemingly humble yet crucial piece of the jigsaw for a sustainable future. With funding from the Rural Development Programme (European Social Fund) and a great deal of support through our partnership with CAT, we have set about teaching our 13 trainees about commercial sustainable food production.

Under the guidance of our food production mentor Emma Maxwell, our trainees have taken part in classes on soil health, business planning, crop rotation and scaling up for sale. Inspired by other ‘farm start’ projects, our training programme has been geared towards helping these growers to earn a future livelihood in what is a notoriously difficult business to break even in. While we know that our fledgling food producers will have to compete with cheap imported food and subsidised large scale agriculture, we also know that the food they will be producing will be crucial to the future food resilience of our community.

Having spent the winter months preparing our ‘microfarm’ sites – one at CAT, one at a local market garden in Machynlleth and one in Newtown – our trainees are now ready to start testing their business ideas. Ideas range from small scale

grain production to children’s vegetable dips to a new veg box scheme. Our trainees have written business plans and are sowing seeds for harvest later in the year.


While we know that we need to increase local food production, we also know that we need to find effective markets for this food. Armed with the understanding that it is very difficult to persuade customers to buy local when that means paying more and eating seasonally, we have been meeting with food businesses around the town. What we found is not what we expected – local cafes and restaurants are more than ready to support their local growers by paying a fairer price and pre-planning menus to include seasonal fluctuation. A wider understanding of the importance of ecologically grown food is fuelling a demand for local produce and businesses are ready to step up.

What we have found lacking in the local food economy are systems for businesses to buy the local produce they want. While growers are busy working the land, buyers don’t know how to connect with their crops. We have been working with a group of existing local food producers on setting up a small pilot sellers coop. Using software provided by the Open Food Network, producers will be able to easily display their produce in an online shop and market their food collectively. Initially this pilot sellers coop will be aimed at selling to a limited

number of hospitality businesses. We hope that as local food production increases, so will the scope for new customers.

We have also been working to build partnerships between growers and chefs, offering chefs the chance to effectively have their own kitchen garden by influencing the crops and flavours a grower produces for them. These partnerships provide the growers with much needed pre-commitments to buy, and enable them to better communicate with their customers about weather fluctuations and unavoidable changes to harvests. We hope that these partnerships will be lasting and will offer a better model than the simple capitalist marketplace transaction.

With all this work to build better markets for locally produced food in Machynlleth, we hope to provide more fertile ground for our trainees to start selling food. Step by step we are hoping to build the foundations for a more resilient local food economy that can weather the storms of climate change and global food price fluctuation.

More info: katie@machmaethlon.org / www.machmaethlon.org 



Doing architecture differently

CAT's Masters in Architecture course explores a wide range of solutions for sustainability. Here we take a look at some of our students' final design projects to see how these architects-in-training are responding to the need to transform our built environment.

Architecture matters.

How we build and retrofit our homes, businesses and public spaces has a huge environmental impact. Currently approximately 50% of energy consumed in the UK is used in buildings. To avoid catastrophic climate breakdown, we need to reach net zero greenhouse gas emissions globally – and we need to start today. The materials we use, the energy that goes into construction, how we interact with habitats and wild species, how energy-efficient our buildings are – all of this and more gives architecture the potential to have a strong positive environmental influence.

CAT's Masters in Architecture allows architects-in-training to specialise in sustainability, exploring the ways that the built environment can be transformed in response to the climate and ecosystems emergency. In June, our fifth year students completed their final projects, bringing together all they've learned during their time at CAT to create imaginative and thought-provoking design proposals for a wide range of situations. Here we present a small snapshot showcasing the range and depth of their work.



Pentremeurig Project – Sophie Zara James

This project was born out of the hope of delving into Carmarthen's past to reveal lost practices that could be beneficial to a sustainable way of life in the present day.

Carmarthen is a town steeped in agricultural history, with a focus on animal husbandry. Until recently the heart of the town was a thriving cattle market that had been encouraged by the drover roads, dating back to Roman times. The cattle market was demolished 20 years ago, but is still remembered fondly.

This proposal hopes to provide and encourage alternative agricultures, a marginal and central sanctuary, community curation and convivial exchange. It looks at re-characterising Carmarthen as a green town striving for self-sufficiency through whole-community involvement and engagement.

This re-characterisation aims to provide Carmarthen with a thriving and unique identity promoting its many assets, while becoming an exemplar green and growing town for others across the UK and the world.

Re.Imagining the Lost Landscape – Martin Johnson

Rural to urban migration has left hundreds of abandoned villages in the Spanish Pyrenees and threatens the existence of many more throughout Spain. These villages represent a culture and heritage based on a self-sufficient and a low impact lifestyle.

This project is a journey into this lost landscape, it aims to record and document the built form but also to learn from this past way of life.

The project, an archive in its infancy, is a platform to assist in the re-population of this landscape and to facilitate those already pioneering a reversal of the rural to urban migration in search of a more sustainable way of life.



“With the support of the tutors, studying at CAT has given me the confidence, knowledge and capability not only to work within the industry but to challenge it and forge my own way. If you are looking for a course that is embedded in sustainability which not only develops your architectural skills but also nurtures your confidence and challenges the current profession – you can’t do better than CAT.”

Josie Turner, graduating student

“I came to CAT seeking alternatives, open to personal development and expecting to find answers. I can say at the end of my time here that I have learnt many things, and the spiritual journey I had begun has been nurtured and continued to flourish. It is clear to me now that the most important lessons I have learnt are beyond architecture, beyond the search for alternatives, they are lessons in humanity.”

Freddy Thomas, graduating student

Find out more about CAT’s Masters in Sustainable Architecture and view more projects in our student yearbook at www.cat.org.uk/architecture

From Ruin to Regeneration: (Re)Claiming The Llwynypia Powerhouse – Josie Turner

The history of the Rhondda Valley and Llwynypia community is varied and complex, with industrialisation and extraction causing deep scars, not only within the landscape but within the communities themselves.

With the fall of the coal industry, the manifestation of the community’s identity has been washing away, along with the documentation that could remind the community of their legacy being locked away in academic institutions in Cardiff and Swansea.

By reconnecting the community with their heritage of self-belief and improvement the project aims to provide a new locational centre for them to hang their identity on.

Evoking the legacy of the Miners’ Institutes, the design is a community take-over of an industrial relic, giving the community back control over their own environment.

The proposal includes an archive to re-engage the community with their past, social and civic spaces, integrating divided cultures, and a structural framework for the community to build into over time, creating a space that adapts to the community’s needs today and in the future.



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Climate strike!

This September, people across the world will join a global week of climate action in support of the school strikers. *Clean Slate* Editor **Catriona Toms** urges you to get involved.



Rise up in solidarity with the school strikers!

Sometimes a single act can become a rallying point for a whole movement. When then 15-year-old Greta Thunberg sat down outside the Swedish Parliament just one year ago, few of us would have predicted that this simple act of rebellion would grow into a million-strong global movement for change.

If you have been as inspired and moved by the school climate strikers as we have here at CAT, then a global week of action this September is your chance to stand up and show your support.

From 20th to 27th September, coinciding with the UN Climate Action Summit in New York, millions of people in more than 150 countries across the world will walk out of their work, homes, colleges and universities and spend a day demanding action on the climate emergency, whilst those who can't go on strike are encouraged to add their voices in other ways.

Greta and 46 other youth activists have issued this invitation to adults around the world:

“Starting on Friday 20 September we will kickstart a week of climate action with a worldwide strike for the climate. We’re asking adults to step up alongside us.... Let’s all join together, with your

neighbours, co-workers, friends, family and go out on to the streets to make your voices heard and make this a turning point in our history.”

Many CAT members will already be helping organise events during the week, many more will be joining in with activities in their communities. Find out what’s happening near you, or get ideas for your own event, on the UK Student Climate Network website: <https://ukscn.org/where-to-strike-in-september>

If you’re a member of a trade union, check with your union to see what they have planned and to encourage them to support the strike. At their annual conference in early September, the Trades Union Congress will be discussing a motion to support the strike via a ‘30 minute solidarity climate stoppage’. The Campaign Against Climate Change Trade Union Group website has more information on this motion, as well as some useful advice on working within unions: <https://www.cacctu.org.uk/>

If you can’t join the strike, perhaps you could use your lunch break to join an event, or take some time to talk to friends and colleagues about the school strikers, what they’ve achieved and why you support their call for climate action.

Share events and news on social media, particularly stories from school strikers, using their hashtags #ClimateStrike and #FridaysforFuture – or write to your local papers about why you support the strikes. You’ll find useful resources for sharing information and promoting the week of action at <https://globalclimatestrike.net/>

This site also has useful guidelines on how to be supportive of the school strikers without taking over. It’s important to remember that young people are asking adults to join their action, but it’s still very much a youth-led protest.

Immediately after the

week of action, we’ll be joined at the CAT conference (see page 12) by some of our local school strikers, who will give us an overview of what they’ve been doing and how we can all get involved going forward.

Thirteen-year-old Anna Antoniadou, for example, has been on strike from Penglais School in the nearby town of Aberystwyth. She says:

“I go on these strikes for my future. Once I understood the real danger our planet was in, I felt like we had to do something straight away. To help us youth, adults need to encourage us to go on these strikes instead of holding us back. Stop telling us just to go back to school. We’re striking for what we believe in – and that’s saving our world.”

From Anna in Aberystwyth to Greta in Sweden to the school strikers in your neighbourhood – all over the world our young people are standing up to demand that those in power take action now to protect our world and their future. Will you join them? [📢](#)

The global week of action takes place 20th-27th September, with strikes planned for 20th and 27th September.

Time for a fossil fuel non-proliferation treaty

Half a century ago, faced with the threat of nuclear catastrophe, the world came together and agreed the non-proliferation treaty. **Andrew Simms** and **Peter Newell** argue that we now need to take the same approach to fossil fuels.



How did government respond to the Intergovernmental Panel on Climate Change conclusion in its special report on 1.5°C that only “rapid, far-reaching and unprecedented changes in all aspects of society” can deliver the globally agreed target for stopping climate breakdown? In the UK, fracking for fossil fuels was given the green light, plans were announced for a huge new road in the south-east, incentives for electric vehicles withered, the expansion of Heathrow airport is still going ahead and Gatwick airport is trying to expand too by bringing a back-up runway into use. It’s like seeing a sign that says “Danger: vertical cliff drop” and pulling on your best running shoes to take a flying leap.

Something isn’t working. The head of the oil company Shell responded to the new climate science warning by clarifying that “Shell’s core business is, and will be for the foreseeable future, very much in oil and gas.” BP announced new North Sea oil projects. Immediate choices are being made with blank disregard for avoiding climate breakdown.

A line in the sand

Climate negotiations and national commitments are simply not moving fast enough to meet the older 2°C climate target, let alone 1.5°C. Global demand for coal, oil and gas are all continuing to grow, with fossil fuels accounting for 81% of energy use. Worryingly, the International Energy Agency projects total fossil fuel use rising for decades still to come, smashing all climate targets.

A new line in the sand is needed to underpin the existing climate agreement, to exert influence over the immediate choices of policymakers. At the very least, the science should mandate a moratorium in rich countries on any further expansion of the fossil fuel industry, or any infrastructure dependent on it.

An international moratorium could take the form of a fossil fuel non-proliferation treaty. The threat of nuclear catastrophe provides a precedent for how, quickly, to stop a bad situation getting worse. The Nuclear Non-Proliferation Treaty (NPT), agreed just over 50 years ago between 1965 and 1968, was a triumph of rapid diplomacy,

at the height of cold war mistrust, and in the face of serious security concerns. It provides a promising precedent in terms of the speed with which the agreement was concluded, and broadly speaking, a useful model for a fossil fuel non-proliferation treaty.

Three pillars

The nuclear non-proliferation treaty is based on a three-pillar structure. The first of these is ‘non proliferation’ itself. Why not cut to the chase and agree to assess those fossil fuel reserves which, if burned, would carry us across the 1.5°C warming line, and monitor their non-use and any measures likely to lead to the proliferation of fossil fuels?

An overall guiding principle would have to be the percentages of each fossil fuel that need to remain in the ground to keep warming below 1.5°C, with continual revisions in line with updated climate models. This would be akin to the NPT process where five yearly reviews are undertaken, and aligns well with the stock-taking exercises proposed as part of the



National action

At the national level, there have recently been bold moves by governments to leave fossil fuels in the ground, which suggests scope for collective coordination and international oversight of further such efforts.

Examples include moratoria on new oil exploration and production announced in 2017 and 2018 by a number of countries including New Zealand, France and Belize, as well as Costa Rica, which has a moratorium on oil exploration in place that has been extended to 2021.

There are also moratoria in place on fracking in a number of jurisdictions globally such as France, Germany, Ireland, Wales, Scotland and Uruguay, and hundreds of subnational jurisdictions. Other countries, such as the UK, Spain and China, have set near-term timetables for the phasing out of existing fossil fuels (especially coal).

Indeed, the 'Powering Past Coal Alliance', launched in November 2017, includes more than 25 nations that have pledged to phase out coal-fired power generation. Membership of the Alliance requires states to make (non-binding) public declarations that they will refrain from building new, unabated coal-fired power stations and will phase out existing ones. Norway's sovereign wealth fund has also divested from coal stocks, while Ireland's Parliament has voted to require its sovereign wealth fund to divest from all fossil fuel stocks.

The 'basic bargain' in the NPT was that, in return for foregoing the acquisition of nuclear weapons, the non-nuclear weapons states secured from the nuclear states a commitment to provide them with nuclear technology suitable for the development of civil nuclear energy industries and to restrain the vertical spiral in nuclear weapon inventories.

In a climate context, that would mean massively expanding existing initiatives to compensate poorer countries for leaving fossil fuels in the ground, while ensuring access to clean energy and the technology

Paris Agreement.

Addressing non-proliferation in the nuclear case required a stock take of who had what weapons. There could be a similar global mapping and assessment of fossil fuel reserves undertaken by the International Energy Agency (IEA) or a UN body, just as the International Atomic Energy Agency (IAEA) performs that function for the NPT.

This assessment would require reporting from national energy ministries on existing reserves, drawing on information held by the fossil fuel industry. As Carbon Tracker's Mark Campanale says, "The fossil fuel industry knows with some certainty future production often decades in advance.... What we need is a global, public register setting out who controls the reserves from where the CO₂ is coming."

Reporting and monitoring of supply-side measures to ensure non-proliferation should be easier than for many other climate policy tools currently in use. First, it would target a relatively small number of large, easily identifiable projects. Fossil fuel infrastructures are easily observable by satellite and so can be straightforwardly

monitored by governments, international institutions and civil society organisations alike. Second, the commodities to be accounted for are not only much easier to monitor and measure than greenhouse gas emissions, but they are typically already measured by firms for existing administrative purposes.

'Disarmament' and 'peaceful use'

The second pillar of the NPT is disarmament. This means rapid substitution of clean energy for fossil fuels and coordinating the managed and accelerated decline of existing fossil fuel infrastructures. But disarmament would also be delivered not just by restricting supply, but also reducing demand. This could be achieved through better planning around energy, housing, transport and food and the construction of climate smart cities for example, all of which can and should be covered under plans to which all parties to the Paris Agreement are already committed.

The final pillar concerns the promotion of the 'peaceful use' of technology.



Fossil fuel extraction is highly visible, therefore easily monitored.

Regulating private polluters

Fossil fuel companies would be subject to home country regulations when operating abroad, bringing them into line with the country's obligations under a non-proliferation treaty.

This is crucial because just six of the largest listed oil and gas companies alone hold reserves that together would use up more than a quarter of the remaining 2°C budget.

Historically speaking, just 90 companies have caused two-thirds of anthropogenic global warming emissions, including OECD-based companies such as Chevron, Exxon, Shell and BP. Approximately half of the estimated emissions were produced in the past 25 years – well past the date when governments and corporations became aware that rising GHG emissions from the burning of coal and oil were causing dangerous climate change.

needed for development as well as, of course, the resources needed to adapt to the climatic upheaval already locked into the system.

Funds could be redirected from the staggering \$10m per minute that governments give in fossil fuel subsidies. The International Monetary Fund found, for example, that eliminating post-tax subsidies could raise government revenue by \$2.9 trillion (3.6% of global GDP), cut global CO₂ emissions by more than 20%, and cut premature air pollution deaths by

more than half. A global carbon tax could be used to further supplement a Global Transition Fund.

Burden-sharing principles

Based on the global map and assessment of the distribution of fossil fuels proposed above, it will become clear which level of contribution a country is being expected to make by leaving reserves in the ground. Given different distributions of fossil fuels among countries, a calculation of their financial value would have to be made so that it is clear what degree of sacrifice each country is making for the common good, and so that equitable degrees of burden-sharing can be allocated.


Burden-sharing would be reflected principally through different targets and timetables for different countries. Crucially, the costs of action should be borne disproportionately by those who have the greatest ability to pay and that are best placed to redirect finance, production and technology towards lower carbon alternatives. The highest emitters of greenhouse gas emissions from the direct burning of their own fossil fuel reserves should act first, and cumulative emissions should be assessed to take adequate account of historical responsibility and use of fossil fuels to date.

Over time though, to be effective, the fossil fuel non-proliferation treaty would need to go beyond current large emitters with the greatest capacity to transition away from fossil fuels and that bear most historical responsibility for climate change, and include most UN members to ensure

that poorer countries are not locked in to high carbon pathways. It would need to help finance – including through the redirection of fossil fuel subsidies as well as multilateral development bank and donor support – lower carbon infrastructures and technologies to meet the energy and other developmental needs of the world's poor.

Transparent and fair

As far back as 1988 at the Toronto conference on the changing atmosphere, climatic upheaval was described as a threat “second only to nuclear war”, a sentiment endorsed from the CIA to MI5 and the United Nations.

National efforts are crucial, but a new fossil fuel non-proliferation treaty supported by movements calling for fossil fuels to be left in the ground, would provide a transparent and fair means to stop climate breakdown. 

The research paper which this article summarises is available for free download at:

<https://www.tandfonline.com/doi/full/10.1080/14693062.2019.1636759>

About the authors

Andrew Simms is an author, political economist and campaigner. He is co-director of the NewWeather Institute and coordinator of the Rapid Transition Alliance. His last book was Cancel the Apocalypse.

Peter Newell is Professor of International Relations at the Centre for Global Political Economy, University of Sussex, and co-editor of The Politics of Green Transformations.

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Climate jobs

As we transition away from an economy based on fossil fuels towards zero carbon there is the potential for the creation of hundreds of thousands of new green jobs. **Anne Chapman** and **Jonathan Essex** of Green House Think Tank explore the opportunities for areas across the UK.



The transition to zero carbon requires a different pathway for the UK economy. Investment is currently focused on the ‘growth centres’ and ‘powerhouses’ of our economy – primarily large cities – and it involves building more houses (often into the countryside) together with more roads and other infrastructure. To deal with climate change the powerhouses that we need to renew are much more human in scale – us!

Sufficient progress to address climate change requires a massive shift of investment from making our built environment and infrastructure ever bigger to making the buildings that we already have more energy efficient, installing renewable energy systems and electric vehicle charging points, improving local public transport, improving resource efficiency through repair and reuse of goods as well as recycling, and re-establishing local food economies that connect urban areas with their rural hinterland. All these will create jobs. Where will those jobs be, what will they be doing, and will they outnumber the jobs that will be lost in fossil fuel dependent sectors?

Modelling UK employment potential

Green House Think Tank has been working on this issue for a number of years for the Green European Foundation, building on the idea of a jobs-led transition put forward by the Green New Deal group and the One Million Climate Jobs pamphlet from the Campaign against Climate Change.

We have developed a model to estimate the number of jobs in particular geographical areas. We looked at the Isle of Wight in 2016, the Sheffield City Region in 2017, then in 2018 looked at the whole of the UK, split into the level three regions used by EU statistics (these put some district councils together). The findings are published in a new report: *Unlocking the Job Potential of Zero Carbon*.

The model sets out a ‘vision’ of what needs to be achieved in each sector; for example, the reduction in miles travelled and modal shift from private car to public transport (for which we drew upon CAT’s *Zero Carbon Britain* reports), or the number of dwellings fitted with solar photovoltaic systems or heat pumps.

It takes available information about the numbers of jobs associated with

the different elements of this vision – installing renewable energy, insulating homes, recycling waste, producing food and increasing public transport – and combines it with data on local areas, such as population, numbers of dwellings, waste production, travel, and land use to produce an estimate of the number of jobs that could be created in each area. An estimate for jobs required to train and support people to take up the new jobs was then added to the total.

Where information was available, the jobs that would be lost (for example in coal fired power stations or in maintenance of internal combustion engine vehicles) were subtracted from the numbers that would be created.

The resulting job numbers are likely to be underestimates because for lots of activities that will be part of the transition, upgrading the electricity distribution system and providing the battery storage needed for an all-renewable supply, no information could be found on the hours of work involved, so estimates could not be made.

Transition and long-term work

The total number of jobs created in the UK during a transition phase (up to

Climate jobs in the UK by region
Transition jobs per 1000 predicted population

Transition FTE - Total / pop



Exported: 28.11.2018
QGIS Version: 2.18.15



Employment could be spread across the UK, bringing income to rural communities and small towns.

2030) was estimated to be 980,000, with 710,000 long term jobs thereafter. Most of the transition jobs are in the installation of renewable energy systems and in the retrofit of buildings (300,000 jobs each). There will also be lots of jobs in completing electrification of the railway system and installing electric vehicle charging points, but no data on these was available so estimates could not be made. Long-term jobs are primarily in public transport (360,000), maintenance of wind turbines (100,000) and reuse/recycling of waste (84,000). The numbers of jobs per head of population are shown in the figure above.

These jobs will be distributed all over the UK, bringing vitality back to our rural economies and small towns rather than being concentrated in large, already prosperous cities. Realising this will require a transition strategy that prioritises these local jobs: small scale renewable energy, not just off-shore wind farms; a programme of street by street retrofit of buildings in every community; supporting local businesses that reuse and repair goods; mechanisms to support agriculture that help farmers

provide permanent jobs, not just short-term seasonal work; good local public transport and live-work communities rather than commuting on high speed long distance trains; electric vehicle charging points in rural areas, not just in towns and cities.

This will require a different spatial plan for development of the UK, linked to a national climate jobs and industrial strategy.

We also need to re-orientate our agricultural system so that it is ecologically sustainable; producing food for the UK population without contributing to climate change while reversing the decline in wildlife and soil nutrients seen in the last 70 years. Such a strategy would strengthen the links between the rural economy and our urban areas, potentially with more local mixed-use agriculture, and more wildlife friendly and productive woodland management, increasing biodiversity and biofuels at the same time.

Resource efficiency

Investment needs to be employment-intensive rather than carbon-intensive. While there will be some need for new

energy generation and local transport infrastructure, there will be a lot of jobs created making better use of what we already have – more energy efficient buildings, improving ‘resource efficiency’ through reuse and sharing, and a reconnection with local food and the rural economy.

One of the authors of the report, Jonathan Essex, said:

“Our research shows that the transition to a zero carbon economy could create more jobs in ways that localise our economy across the UK. This is good news. But it also illustrates the scale of the challenge. “Alongside the jobs in our plan there needs to be an industrial transition, shifting from making fossil-fuel dependent products to those needed by a zero carbon economy: for example from internal combustion engine to electric vehicles.

“Workers in these industries and those in fossil-fuel dependent sectors who will lose jobs need to be given the training and support needed to take up the new jobs. “Making this happen requires local leadership to create the plans and new enterprises that deploy the skills and



Training is needed in the skills to help with climate solutions.
Pictured: builder Emma Appleton (centre) teaches timber frame construction methods.

expertise of people in the UK. Achieving it would result in stronger, healthier and more locally sustainable communities. “Only by working together in such ways can we truly do our part in tackling climate change.”

For example, consider just one of these job-intensive sectors: waste. We envisaged a reduction of 90% in waste going to incineration and landfill, through waste reduction, reuse and high-quality recycling. This could be encouraged with the establishment of a whole range of enterprises at the local scale, which are being set up in many places following the public awareness of plastic waste. There are a growing number of Repair Cafés and Men-in-Sheds projects (a community fix-it centre that addresses social isolation) as well as sharing initiatives such as a Library of Things alongside established projects to reuse second-hand furniture.

But why not extend this to construction and demolition, and re-popularise the notion of salvage and reuse surplus building materials from construction sites? This would sit well with the introduction of carbon taxes, which would make repurposing and reuse of products

more viable economically – for example, reuse of cardboard boxes, or repair of small electrical items. This then creates possibilities for new jobs, using the recycled materials and retailing the reconditioned or repurposed products. In addition, there will be jobs in redesigning products so that they are more durable and more adaptable.


Unlocking the potential

The report on our 2018 work, *Unlocking the Potential of Zero Carbon*, is available on the Green European Foundation website. It includes estimates of jobs in Ireland and Hungary as well as the UK. The main report explains our methods and assumptions with summaries of the results while an appendix, downloadable as a separate file, gives the results for each UK area.

We acknowledge that there is scope for improving our modelling by improving accuracy and reliability of existing modelling and by filling in gaps in the jobs metrics. We would welcome constructive feedback on our work, especially from those who could provide additional sources or suggest changes to our modelling assumptions.

This year we hope to improve our model and produce summary sheets for local

areas of the UK. We are also working on jobs estimates for Poland, with support from Fundacja Strefa Zieleni and the Institute of Eco-development in Poland.

Making plans for a zero carbon economy is the next step following the declaration of a climate emergency by many local councils across the UK. You can find out more about how to do this, and hear about our work on climate jobs, at our ‘*Climate Emergency, Raising Ambition*’ conference in London on 14th September, where CAT’s Zero Carbon Britain project coordinator Paul Allen will also be speaking. Find out more and book your place at <https://www.greenhousethinktank.org/events> 

About the authors

Anne Chapman has been involved in the environmental movement for over 20 years. She is the author of Democratizing Technology, published by Earthscan in 2007. She is currently a director of Green House Think Tank. Jonathan Essex is a chartered engineer. He has worked for engineering

consultants and contractors in the UK, Bangladesh and Vietnam. His current work focuses on improving the sustainability and resilience of livelihoods and infrastructure investments worldwide. He is also a Green Party district and county councillor in Surrey.

Find out more

Unlocking the Job Potential of Zero Carbon; Report on the case studies United Kingdom, Hungary and the Republic of Ireland, by Anne Chapman, Jonathan Essex and Peter Sims, is available at: <https://gef.eu/publication/unlocking-the-potential-of-zero-carbon/> It is produced by the Green European Foundation with the support of Green House Think Tank and with the financial support of the European Parliament to the Green European Foundation.

Green House Think Tank publishes reports and organises events to promote the development of green thinking in the UK. www.greenhousethinktank.org

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A Green New Deal for homes

As the campaign for a Green New Deal gathers pace in both Britain and the US, **Jonathan Atkinson** looks at how it could help transform UK housing.



A Carbon Co-op whole house retrofit.

As the case for radical action on climate change grows ever stronger, Alexandria Ocasio-Cortez, Ed Markey and others within the progressive wing of the Democratic Party are advocating a Green New Deal for the United States. Inspired by its scale of ambition many are now advocating a similar approach in the UK.

What might a Green New Deal mean for a housing sector widely acknowledged as being in crisis, how might it help improve housing for the most vulnerable whilst meeting the challenge of climate change and how do we avoid the past disasters of state-led energy efficiency programmes?

It may seem that the Green New Deal is an idea imported from the United States, but in fact it began life as a report authored in the aftermath of the 2008 global economic crisis by a group of radical economists, thinkers and politicians including Ann Pettifor, Andrew Simms, Caroline Lucas and Richard Murphy.

The report advocated a radical response to intertwined economic and climate crises,

combining quantitative easing, large scale investment in green infrastructure, a robust plan for green jobs and a re-evaluation of how we define 'economic good'. The most striking aspect of the report was its scale of ambition, suggesting nothing less than a radical reconfiguring of the UK's economy, governance and financial systems. Though well received, the report inevitably failed to gain traction at a time of a coalition government implementing an ideologically motivated austerity programme.

Spin forward ten years and the rising progressive wing of the Democratic Party found inspiration in the core ideas of the Green New Deal plan, re-evaluated in a context of increasingly common climate disasters, calls for a just transition away from hydro-carbon jobs and a newly energised black activist movement emerging in opposition to the Trump administration.

Compellingly the Green New Deal brings together sometimes disparate progressive agendas under a single policy. For environmentalists, it offers the large

scale mobilisation of resources necessary to radically decarbonise our existing infrastructure, using state debt to invest in new renewable generation, green industrial processes and housing retrofit. For trade unions concerned about job losses from old industrial sectors, it promises investment in training and the creation of new, well paid and secure jobs. For civil society and advocacy groups concerned about the social impact of new policies, it offers 'energy justice' and a rebalancing of society to protect the most vulnerable, redistributing wealth through a progressive tax agenda.

Now politicians, trade unions and activists are seeking to launch the Green New Deal in a UK context with Caroline Lucas and Clive Lewis launching a private member's bill to legislate for the policy. Labour's business minister Rebecca Long Bailey has spoken in favour of it and 'Labour for a Green New Deal' is pushing the agenda forward.

A Green New Deal for housing

We know that addressing home energy use is a key element of any meaningful climate change policy, and after years of government inaction on the topic, a Green New Deal is hugely welcome. It offers exactly the radical thinking and large scale investment necessary to transform our housing stock.

Whilst much effort will go into building new, low or even 'zero carbon' homes (note that the term zero carbon hides a multitude of complex debates!) the main focus of the Green New Deal will be on creating a viable plan for retrofitting the 25 million homes currently standing in the UK.

This will involve deep or whole house retrofit, insulating homes from top to bottom whilst tackling windows, doors, roofs, floors and ceilings, fitting solar panels and upgrading energy and heating systems.

In the private sector, state-backed programmes, similar to KfW in Germany, will be needed, with subsidised householder lending. In the social sector, the good work already done needs to be built on with effective mechanisms for housing association borrowing and collectivised



Campaigners in the US call for a radical government investment plan.

works. And in the private sector, landlords need carrots in the form of preferential lending and regulatory sticks in terms of enforcement of poor performing homes.

New community or municipal scale roll-out mechanisms need to be developed, with street or area based approaches necessary to deliver millions of home retrofits each year. And to support this we need a well paid, appropriately skilled workforce with 'fit-for-purpose' quality assurance frameworks.



Avoiding past mistakes

It may sound simple, but it's not and we need look no further than the past few years, when energy efficiency improvement schemes were relatively more common, to see the pitfalls.

Scandalous schemes such as Fishwick Road in Preston, where poorly planned, energy supplier-funded works, delivered to unrealistic timescales by badly trained staff led to widespread damage, leaks, poor

quality home environments and aggrieved residents seeking justice.

These schemes were often delivered by large construction companies such as Carillion, subcontracting local staff whilst offering poor conditions, wages and training. This form of procurement led to a 'race to the bottom' in terms of costs and quality, and as the example of Carillion shows, was ultimately unsustainable for all involved.

At Grenfell Tower, a similar culture of outsourcing and procurement led to disaster. Seventy-two people died and the surrounding areas are now heavily polluted by the residue of the burnt insulation materials, demonstrating the poisonous nature of the building materials used. Increasingly evidence suggests that even in normal circumstances, such materials don't sit inertly within homes but affect the long term health of residents.

Learning the lessons

Too often it has been the most vulnerable residents in the least well off communities who have suffered the consequences of substandard work done in the name of 'energy efficiency' and low carbon homes. But we know that housing retrofit doesn't need to be done like this.

Carbon Co-op and others have demonstrated that deep, whole house retrofit can be achieved at relatively affordable costs, using skilled, local professionals and natural, sustainable materials, such as wood fibre insulation, that don't poison householders or the environment.

Only the state can mobilise resources at the speed and scale necessary to decarbonise to the extent required to meet the challenge of climate change.

But the state has a poor track record of empowering citizens and communities and, at least in recent history, of being able to procure safe, high quality projects at good value.

The Green New Deal has the potential to transform homes and communities, but to truly transform society it needs to incorporate and involve citizens in its delivery mechanisms, to take a holistic, localised and progressive approach to procurement and to recognise the wider sustainability and toxicity of the materials used in its delivery. [G](#)

About the author

Jonathan Atkinson is an environmental activist and co-operator based in Manchester, UK. He is co-founder of Carbon Co-op, a community business that develops ways for people to take collective action on climate change in their homes and communities.

A Green New Deal for Homes was the topic of the Carbon Co-op's Annual General Meeting 2019 which took place in Manchester in May. The event featured contributions from radical architect Tom Woolley, campaigner Rowan Mataram of Platform, and practitioners Aneeka Kellay and Ben Aylott of Carbon Co-op. Presentations, videos and a short blog from the event can be found at <https://s.coop/23oti>

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Old, cold and damp – how to improve traditional buildings

One in five UK buildings dates to before 1919, and they are often poorly insulated and difficult to keep warm and dry. We talked to conservation builder and CAT course tutor **Nathan Goss** to find out his top tips for making improvements to traditional buildings.



Why do pre-1919 buildings need to be treated differently from more recent builds?

Most traditional builds (pre-1919) were designed with solid wall construction of stone, brick or cob/clom, with no impermeable membranes or moisture barriers.

They rely totally on the breathability of materials and design, where moisture is soaked up by the structure, then any excess moisture is expelled rapidly, avoiding any damage or decay to the building.

Not all pre-1919 buildings are given the protection afforded to a listed building but whether you are repairing a terrace house or a vernacular cottage the rules of traditional maintenance and repair are the same.

What are the common problems that people encounter with traditional buildings?

Damp is the most common problem I come across in traditional buildings; this varies in severity, from a damp patch on a wall to dry rot throughout a building.

The first step in assessing any suspected moisture damage in a traditional building

is to examine the nature and distribution of the damage. Different moisture sources generally result in different patterns and types of damage. Broadly speaking, damage associated with liquid water is localised and severe, while that caused by microclimatic factors is more widespread and evenly distributed.

With some basic investigation, liquid water damage can be identified by a careful study of the building and its moisture drainage routes. The design of any successful building should enable rainwater deposited on the outer shell to be transported away to a safe location. If there is water damage on the internal surfaces, it suggests that either the design itself is faulty or the system is damaged. Signs of damage are not always internal; sometimes they are easily seen whilst examining the external envelope of the building.

Microclimatic investigation is more in-depth and scientific than liquid water investigation. In short, you need to understand the relationships between cold surfaces, humidity and condensation to control the indoor climate of a building. These can be measured using a thermal imaging camera and hygrometer.

So what's the best way to keep a traditional building warm and dry?

It is possible to maintain old buildings, provided that excessive air infiltration and heat loss are reduced and reasonable ventilation is maintained.

Unfortunately, many people equate pre-1919 houses with memories of living in draughty, unheated cold spaces with no insulation and with sash windows that rattled in the wind and suffered from condensation in the mornings.

If this is your memory, then you were 100% correct but sadly you left one small detail out – the houses were not damp!

As air flow around the house was fantastic, moisture could move freely and evaporate at speed. When we start damp proofing, sealing up draughts and over-insulating buildings we begin to trap incoming and self-generated moisture within the structure, and this can lead to a number of problems.

It is possible to find the right harmony between air flow, heat loss and ventilation but every building has to be treated on its own merits. There are so many variables to take into consideration, like the size and



Treleddydd Fawr, a 17th century cottage which Nathan helped assess for the National Trust.

use of the building, direction of prevailing weather, materials used in construction, window size, roof design, and so on. Generally, there is always a solution to be found; whether this is effective is usually down to whether the custodian of the building adheres to the changes required.

You've been involved in restoring a lot of old houses – what are some of the common mistakes people make?

Over the past 30 years I have seen mistakes made in everything you can imagine, from damp proof course injection to cement rendering and, worryingly, I can say that most of the problems stem from ill-informed home owners or unqualified contractors.

If I was to compile a top five list it would look something like this: 1. Cement pointing; 2. Cement rendering; 3. Damp proof course; 4. Non-breathable paints; 5. Non-breathable felt.

All of these can cause untold damage to your building. If a combination of these mistakes is found within a building then it's not a question of 'if' the problems are going to start, it's a question of 'when' and at what severity and scale.

What's the first thing you would recommend to an owner of a traditional building that's struggling with cold and damp?

My best advice for anyone that lives in or has just moved into a traditional building is to get to understand your home. It is essential to understand where the cold spots of the house are to reduce any chance of damp, to monitor the ventilation of the house and identify where heat loss may be occurring, and to keep an eye on the

weather to see where the prevailing rain is coming from.

A great place to start is with maintenance – with all traditionally built structures there will be issues to deal with annually. Because these buildings rely on the evaporation of moisture to maintain their breathability, then keeping all your gutters, downpipes and drains clear of foliage will help matters considerably.

One tip – if you see small white spots on your internal wall, then this may be the first sign of your building depositing 'effervescent salts', which usually occurs when a wall is holding moisture and cannot breathe. The heat within the house pulls the moisture inwards and as it dries beneath the internal paint surface it deposits salts, which eventually break through the paint.

Where can I find out more information on traditional materials and methods?

There is no excuse these days to use inappropriate materials on pre-1919 buildings as there are so many different options on offer from various sources around the UK, from lime mortar to more modern technologies like cork for insulation.

There is also a plethora of information available on the internet and from professional organisations such as Historic England, CADW, SPAB, IHBC and ICOMOS UK.

You will also find there are some really good materials suppliers, such as 'Ty Mawr Lime' in Brecon, who will be more than happy to deal with any questions, give out unbiased solutions to problems or point you in a direction where you can find the answers you are looking for.

Many old buildings have draughty windows leading to wasted heat energy – what solutions would you recommend?

One enduring myth is that old windows account for 20 per cent or more of the heat lost from a building.

Historic England has carried out a series of tests on historic buildings to determine heat loss. In all cases, the windows were of historical interest and none had been repaired or particularly well maintained. But when the tests were completed it was apparent that the amount of leakage from the windows was a lot lower than expected (10 to 15%). The real problem areas were often not visible to the eye and occurred in quite obscure parts of the building.

If you are determined on change then first repair, refit or adjust the windows you already have to minimise heat loss, then either look at replacing your curtains with a heavier material or introducing shutters or blinds.

You can save up to 10% of heat loss by carrying out the methods above before contemplating double glazing.

If you really want to go for double glazing then try the slimline version, which may fit within your old window sashes or – in the worst case scenario – you may need to have new windows. [GS](#)

About the author

Nathan has over 30 years' experience working in a variety of roles, all of which have involved carpentry and joinery, historic building surveying, project management, conservation and the restoration and consolidation of old buildings. He is currently working as a conservation buildings adviser for the Strata Florida Trust and restoring a wooden palace in Ethiopia.

CAT course

Nathan teaches CAT's 'Fix your Damp House' course, which gives you an in-depth understanding of how to spot signs of damp and make the necessary improvements to your building. The course includes practical DIY sessions as well as classroom-based learning.

The next course takes place on 21-22 September.

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Your legacy to future generations

One way that many people support CAT is by leaving a gift to our charitable education work in their will.



CAT's legacy to young people – teaching the practical skills needed to address climate change.

Legacy is a key word when talking about climate change and other environmental issues. It means *'something that is a part of your history or that remains from an earlier time.'*

The legacy of human impact on the Earth's eco-systems is a key focus at CAT. Our educational visitor centre and woodland is a place where humans have learned to live and work whilst enhancing biodiversity. From a disused slate quarry, CAT has created expansive organic gardens, natural reed bed sewage systems, rammed earth and strawbale buildings that are a 'living' testament to how humans are part of, and not separate from our eco systems. The site thrives with birds, pollinators, healthy soil, plants and people.

The legacy of climate change is our history of emissions, as individuals and as societies. Fossil fuels are part of our history – quite literally – they are the history of the natural world compressed into the rock and forced out via drills and pipelines. Often extracted from the poorest populations to power other more affluent societies. The subsequent emissions forced into our atmosphere indiscriminately affect the people least responsible, including future generations, leaving a lasting legacy of destruction.

Changing that legacy, shifting our societies – their investments, economies, energy systems, building and planning, land use and food systems – to zero carbon systems, and leaving a healthy climate and thriving eco system for our children and

future generations, is CAT's aim.

All of our work is about this: the school and college groups that learn at CAT; the Masters courses that teach practical skills to solve climate change; our experts who work tirelessly all over the UK to create workable climate action plans with communities and local authorities; the thousands of holidaymakers who arrive at CAT's visitor centre and receive education and guided tours on climate solutions.

We are leaving a legacy of skills and knowledge to hundreds of thousands of people. Will you help us by leaving a legacy to CAT to continue this vital work?

If you'd like to talk about leaving a legacy to CAT and for future generations, please call Tanya for a chat on 01654 704950. [CS](#)

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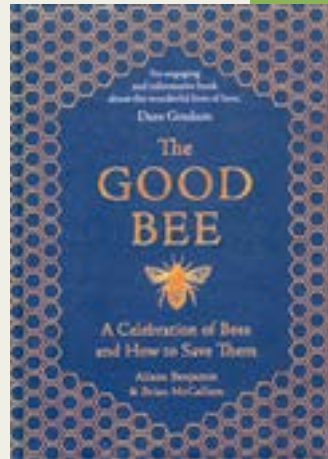
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The Good Bee: A Celebration of Bees - And How to Save Them

By Alison Benjamin

Discover the complexities of bee behaviour, the part they play in the natural world, their relationship with people, how they are threatened and what we can all do about it.

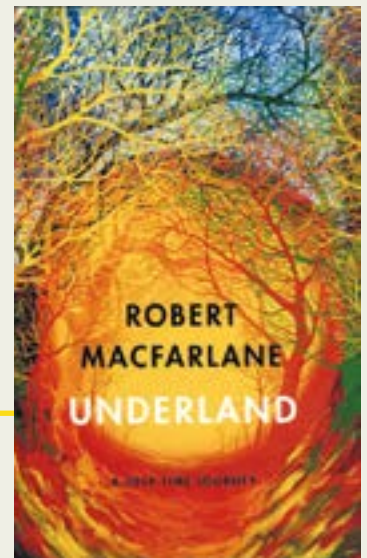
Hardback, £9.99

Underland

By Robert Macfarlane

Take a journey into the world beneath our feet with the author of *The Old Ways* and *The Lost Words*.

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No One is Too Small to Make a Difference

By Greta Thunberg

'Everything needs to change. And it has to start today'. Read the collected speeches of the ever-inspiring young climate activist.

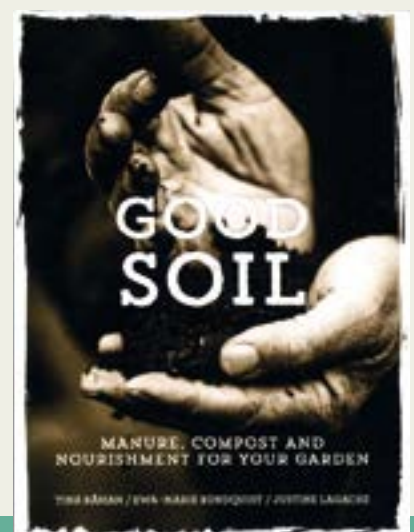
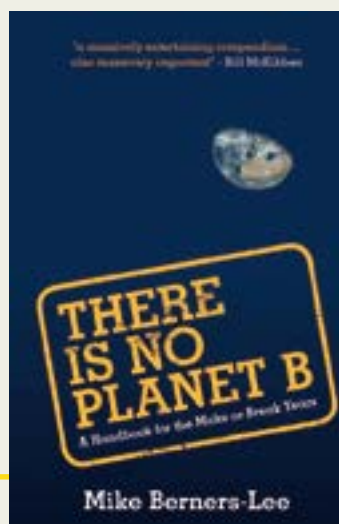
Paperback, £2.99

There is No Planet B: A Handbook for the Make or Break Years

By Mike Berners-Lee

Explore solutions to some of the pressing challenges of our time. A wide-ranging highly readable book covering climate, food, technology and society.

Paperback, £9.99



Good Soil by Tina Raman

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